

WHAT IS CLAIMED IS:

1. A ring network comprised of a plurality of transmission apparatuses connected in a ring shape by a transmission line,

5 each of said plurality of transmission apparatuses including a cross-connect function unit and a communication function unit communicating among them over said transmission line using overhead of a transmission frame,

10 at least a transmission apparatus serving as a master among the plurality of transmission apparatuses including a path management database for collecting and storing path setting information of all of said transmission apparatuses, a path decision unit for  
15 determining a long path when switching from a UPSR mode to a BLSR mode, and an interchange decision unit for determining interchange of a path on a protection channel to an idle work channel and requesting path interchange.

2. A ring network as set forth in claim 1, wherein  
20 said path decision unit has a means for deciding on a long path to be deleted based on path setting information stored in said path management database and sending a request for deletion of path setting information based on the result of the decision  
25 and

an interchange decision unit has a means for deciding whether to change a path set on a protection channel to an idle work channel and sending a request for interchange based on path setting information stored in  
30 said path management database.

3. A method of path interchange for changing, in a ring network comprised of a plurality of transmission apparatuses connected in the form of a ring by a transmission line, from an operating state of the UPSR  
35 mode to an operating state of a BLSR mode comprising:

making one among the plurality of transmission apparatuses a master,

inputting a command for updating from the  
UPSR mode to the BLSR mode to the master transmission  
apparatus and,

5 in accordance with the command, having the  
master transmission apparatus

collect path setting information of other  
transmission apparatuses to store it in a path management  
database,

10 decide on a long path by referring to the  
path management database, delete the path setting  
information of the long path, and update the path  
management database and

15 decide on a path on a protection channel  
referring to said path management database, change the  
path to an idle work channel, and update the path  
management database.

4. A method of path interchange as set forth in  
claim 3, further comprising:

20 a step of having a master transmission  
apparatus send a BLSR update request message to other  
transmission apparatuses to make each transmission  
apparatus shift to a BLSR update request state, send a  
BLSR update execution message to make each transmission  
apparatus shift to a BLSR update execution state, and  
25 send a path information request message;

having each of said other transmission  
apparatuses send a path information response message  
including path setting information in reply to said path  
information request message; and

30 having said master transmission apparatus  
store the received path setting information in the path  
management database, and

a step of having a master transmission  
apparatus decide on a long path by referring to the path  
35 management database;

send a path control request message for  
deleting the path setting information of the long path;

receive a response message in reply to  
said path control request message; and

update said path management database; and

a step of having said master transmission

5 apparatus decides on a path on a protection channel by  
referring to this path management database;

send a path control request for  
interchanging said path to an idle work channel;

10 receive a response message in reply to  
said path control request message to update said path  
management database; and

make the BLSR update execution state shift  
to an initial state.

15 5. A method of path interchange as set forth in  
claim 4, further comprising sending said messages between  
said master transmission apparatus and said other  
transmission apparatuses using overhead of a transmission  
frame transferred over said transmission line.